being punched

fq1 ✓

(10) 1870 1871 1629

July 23, 1968

Neil:

Enclosed: short table of Bessel polynomials
" " convolved Fibonacci nos.

For $p_n(x) = \sum_{k=0}^{n} \binom{n+k}{2k} x^k$ = assoc. Legendre polynomial

$p_n(1) = f_{2n}$

$p_n'(1) = \frac{1}{2} f_{2n-1}^{(2)}$ – convolved Fib no of order 2 – (*)

$\Pi_n(x) = \sum_{k=0}^{n} p_k(x) = \sum_{k=0}^{n} \binom{n+1+k}{2k+1} x^k$

$\Pi_n(1) = f_{2n+1}$

$\Pi_n'(1) = \frac{1}{2}\left[f_{2n}^{(2)} - f_{2n+1} \right] = f_{2n+1}^{(2)} - (n+2) f_{2n+1} = \sum_{k=0}^{n} p_k'(1)$

$= \Pi_{n-1}'(1) + p_n'(1)$

	n	0	1	2	3	4	5	6	7	8	9	10	
type 1 (*)	$p_n'(1)$	0	1	5	19	65	210	654	1985	5911	17345	50305	1870
	$\Pi_n'(1)$	0	1	6	25	90	300	954	2939	8840	26185	76490	1871
	$u_n'(1)$	0	0	1	2	5	10	20	38	71	130	235	1629

many errors

JR

P.S. For $u_n = \sum_{0}^{[n/2]} \binom{n-k}{k} x^k$ = assoc Chebyshev polynomial

$u_n(1) = f_n$ – Fibonacci $f_0 = f_1 = 1$

$u_n'(1) = f_{n-2}^{(2)} = \sum_{j=0} \binom{n-j}{j} j = \sum (n-1-j)\binom{n-2-j}{j} = {}^{(n-1)}u_{n-2} - u_{n-2}'(1)$ ✓

GN-553-2 (1

Bessel Polynomials

$y_n(x) = \sum \binom{n+k}{2k} a_k x^k = (2n-1)x\,y_{n-1} + y_{n-2}$ $= \sum y_{nk} x^k$

$a_k = (2k)!/2^k k! = (2k-1)a_{k-1}$

1515
1147
457
1879
1881
906
907

✓1515

$y_n(1)$	n\k	0	1	2	3	4	5	6	7	8	9	10
1	0	1										
2	1	1	1									
7	2	1	3	3								
37	3	1	6	15	15							
266	4	1	10	45	105	105						
2431	5	1	15	105	420	945	945					
27007	6	1	21	210	1260	4725	10395	10395				
353 522	7	1	28	378	3150	17325	62370	135135	135135			
5329837	8	1	36	630	6930	51975	270270	945945	2027025	2027025		
90960751	9	1	45	990	13860	135135	945945	4729725	16216200	34459425	34459425	
	10	1	55	1485	25740	315315	2837835	18918900	9~~2~~1891800	310134825	654729075	654729075

1881 1880 457 1879 1147

constant differences in this direction